

Appl. No. 10/800,888  
Amdt. dated January 29, 2007  
Reply to Office Action of November 29, 2006

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### REMARKS

Applicants wish to thank the Examiner for the interview on January 25, 2007.

Entry of the foregoing and further consideration of the subject application in light of the remarks which follow and consistent with 37 CFR § 1.116 are hereby respectfully respectfully requested.

Claims 1 through 26 and 50 are pending and Claims 27 through 49 are canceled. Claim 1 is amended to recite "addition" hydrogenation activity. Support for this amendment can be found in paragraphs [0035], [0036], and [0037]. Claims 1 and 23 are amended to recite a catalyst treatment feed as suggested by the Examiner in the Office Action. Claim 50 is new. Support for claim 50 can be found in paragraphs [0013], [0018], [0034], and [0038].

### REJECTION UNDER 35 U.S.C. § 112

Claims 1-26 stand rejected under 35 U.S.C. § 112, first paragraph. Amended Claim 1 now recites "addition" hydrogenation activity.

Claims 1-26 stand rejected under 35 U.S.C. § 112, second paragraph. Amended Claims 1 and 23 now recites a "catalyst treatment" feed as suggested by the Examiner in the Office Action.

Applicants respectfully submit that Claims 1-26 are in compliance with 35 U.S.C. § 112. Withdrawal of this rejection is respectfully requested.

### REJECTION UNDER 35 U.S.C. § 103

#### Applicants' Claimed Invention

The use of catalysts in hydrocarbon conversion with an addition hydrogenation activity or hydrogenolysis activity that is too high can cause deleterious effects, e.g., loss of valuable compounds and damage to equipment and catalyst. For example, if the catalyst used in a xylenes isomerization/ethylbenzene dealkylation reactions has hydrogenolysis activity that is too high, ethylene formed in the dealkylation of ethylbenzene to ethylene and benzene can be cracked to

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methane. In addition, the ethylene cracking reaction generates a large amount of heat, which can cause large exotherms inside the reactor, which can lead to damage of the catalyst, equipment, or both. Still further, if catalysts used in aromatics conversion have addition hydrogenolysis activity that is too high, the aromatic compounds can undergo aromatic ring saturation, which results in the loss of high value aromatics, e.g., xylenes.

The presently claimed invention, as set forth in Claims 1 through 26 and 50, involves treating a molecular sieve catalyst containing a Group VIIB or Group VIII metal with hydrogen to reduce the addition hydrogenation activity of the catalyst by at least 10 percent (in comparison to the untreated catalyst) or the hydrogenolysis activity by at least 25 percent (in comparison to the untreated catalyst). Applicants' process is carried out by treating the catalyst with a feed consisting essentially of hydrogen under sufficient conditions of temperature and pressure and for a time of at least 4 hours to reduce the addition hydrogenation activity of the treated catalyst in an amount of at least 10 percent in comparison to the untreated catalyst. As shown in Examples 2 and 3 of the present application, the practice of the Applicants' invention substantially reduces the addition hydrogenation activity of the catalysts.

Applicants believe that addition hydrogenation activity reduction is due to chemical bonding of hydrogen to the hydrogenation metal atoms. This bonding causes inactivation of at least a portion of the hydrogenation metal atoms. The hydrogen to hydrogenation metal bonding is a slow and difficult process that is dependent upon the hydrogenation metal present in the catalyst, the hydrogen pressure of the treatment, the temperature of the treatment, and the duration of the hydrogen exposure to the hydrogenation metal. Independent Claims 1 and 23 specify an extended hydrogen treatment time (treatment time of at least 4 hours).

**Rejection based on U. S. Patent 5,990,365**

Claims 1 through 26 stand rejected under 35 U.S.C. § 103 as being unpatentable over U. S. Patent 5,990,365 (Chang et al.). This rejection is specifically traversed as the invention, as set forth in presently pending Claims 1 through 26 and 50, is submitted to be patentable over Chang et al.

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Chang et al. does not disclose or suggest treating a zeolite catalyst containing a Group VIIB metal or a Group VIII metal with feed that consists essentially of hydrogen. The feed of Chang et al. comprises hydrocarbons, e.g., toluene, and hydrogen with a molar ration of hydrogen to hydrocarbons (e.g., toluene) from 0.1 to 20 (Chang et al. column 8, lines 51-55). Applicants submit that the process conditions of Chang et al. would NOT inherently result in presently pending Claims 1 through 26 and 50 because the feed of Chang does not consist essentially of hydrogen. Furthermore, the treated catalyst in applicants' application is used for minimizing undesired hydrogenolysis activity, e.g., ethane to methane reaction.

It is respectfully submitted that Chang et al. involves does not disclose or suggest presently pending Claims 1-26 and 50. Withdrawal of this rejection is respectfully requested.

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**CONCLUSION**

Applicants respectfully submit that presently pending Claims 1 through 26 and 50 are patentable over Chang et al. Favorable action hereon is respectfully requested.

Respectfully submitted,

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Xiaobing Feng  
Xiaobing Feng  
Attorney for the Applicants  
Registration No. 57,231

ExxonMobil Chemical Company  
Law Technology  
P. O. Box 2149  
Baytown, Texas 77522-2149  
Telephone: (281) 834-0355  
Facsimile: (281) 834-2495